The Theory of Intermolecular Forces
by Anthony J. Stone (Oxford University Press, 1996)
reprinted in paperback, with corrections, 1997
and with further corrections, 2000

Unfortunately there were a number of errors in the original hardback edition. Some of these were corrected in the 1997 paperback reprint, and a further batch were corrected in the 2000 reprint. A few further corrections have since come to light. All these corrections are listed here.

I would be grateful to be told of any further errors that you may find. I will endeavour to keep this list up to date; please check http://www-stone.ch.cam.ac.uk/timf/corrections.pdf before reporting further errors. The last corrections were added on 29 August 2008.

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The following corrections need to be made to the 1996 hardback edition, but were included in later editions:

p. 81, eq. (6.1.3):
This equation (starting on p. 80) should read as follows:

\[ U_{\alpha\epsilon} = \frac{S^2}{1-S^2} \left( a(1)b(2) \right| \frac{1}{r_{A2}} - \frac{1}{r_{B1}} + \frac{1}{r_{12}} a(1)b(2) \right) \\
- \frac{1}{1-S^2} \left( a(1)b(2) \right| -\frac{1}{r_{A2}} - \frac{1}{r_{B1}} + \frac{1}{r_{12}} a(2)b(1) \right) \\
= - \frac{S^2}{1-S^2} \left[ \left( b \right| \frac{1}{r_{A}} \right| a \right) + \left( a \frac{1}{r_{B}} \right| b \right) - \left( a(1)b(2) \right| \frac{1}{r_{12}} \left| a(1)b(2) \right) \right] \\
+ \frac{1}{1-S^2} \left[ S \left( a \right| \frac{1}{r_{A}} + \frac{1}{r_{B}} \right| b \right) - K_{ab} \right]. \]  

(6.1.3)

p. 91, l. 11:
The citation of Jeziorski & Kołos (1977) is incorrect here (though they are correctly cited on l. 13); this one should be Jeziorski et al. (1978).

p. 231, Table E.5:
The right-hand-side of every entry should be divided by 3.

p. 234, Table F.1:
The following entries should be corrected as shown:

| 41c | 00 | \( R^{-\frac{5}{3}} \frac{1}{3} \sqrt{10} (7r_r^2 r_z^3 - 3r_y^2 r_z^2) \) |
| 41s | 00 | \( R^{-\frac{5}{3}} \frac{1}{3} \sqrt{10} (7r_r^2 r_z^3 - 3r_y^2 r_z^2) \) |

The following corrections were included in the 2000 paperback reprint, but need to be made to earlier editions:

p. 15, top line:
The statement that the other components ‘are all zero’ is nonsense. (I must have been thinking about the spherical components when I wrote that.) For the molecules previously discussed, which are all linear or symmetric tops, \( \Theta_{xx} = \Theta_{yy} = -\frac{1}{2} \Theta_{zz} \), and all of these will be nonzero.

p. 24, 6 lines below (2.3.14):
The anisotropy \( \Delta \alpha \) should be \( \alpha_{zz} - \frac{1}{2} (\alpha_{xx} + \alpha_{yy}) \).

pp. 25–26:
In eqs. (2.4.2) and (2.4.3) and the two preceding equations, the denominator in the second term should be \( (W_n - W_0)^2 \). not \( W_n - W_0 \).
In eq. (2.5.6), there is a missing closing parenthesis at the end of the numerator of the last two lines. The $\omega_{k0}$ in the numerator of the last line should be $\omega$. In eq. (2.5.7) there is a missing closing bracket at the end of the numerator.

p. 38, eqs. (3.1.9) and (3.1.10):
There is an error of sign in the last line of each of these equations, which should read:

$$F_A^\alpha(B) = -\nabla_\alpha V^A(B)$$

$$= -T_\alpha q + T_\alpha \tilde{\mu}_B - \frac{1}{3} T_\alpha \tilde{\Theta}_{\beta\gamma} + \cdots$$

$$\cdots = \frac{(-1)^n}{(2n-1)!} T^{\beta}_{\sigma_1 \cdots \sigma_n} \tilde{\mu}_{\sigma_1 \cdots \sigma_n} - \cdots, \tag{3.1.9}$$

and for the field gradient,

$$F_{\alpha\beta}^A(B) = -\nabla_\alpha \nabla_\beta V^A(B)$$

$$= -T_{\alpha\beta} q + T_{\alpha\beta} \tilde{\mu}_B - \frac{1}{3} T_{\alpha\beta} \tilde{\Theta}_{\gamma\delta} + \cdots$$

$$\cdots = \frac{(-1)^n}{(2n-1)!} T^{\gamma}_{\sigma_1 \cdots \sigma_n} \tilde{\mu}_{\sigma_1 \cdots \sigma_n} - \cdots. \tag{3.1.10}$$

I believe that the subsequent equations are correct as to sign.

p. 53:
The l.h.s. of eq. (4.2.1) should refer to $U_B^\text{ind}$, not $U_A^\text{ind}$. In the line below the equation, replace ‘merely’ by ‘minus’.

p. 77:
in l. 7 of the paragraph numbered 2, the integral should include a factor $r_{12}^{-1}$.

p. 183:
There should be no sum over $B$ in eq. (11.7.10).

p. 188:
Eq. (12.1.4) is better expressed in the form

$$f_n = \frac{2}{3} \frac{\hbar \omega_n}{E_h} \frac{|\langle 0 | \hat{\mu} | n \rangle|^2}{\varepsilon^2 a_0} \tag{12.1.4}$$

where $E_h$ is the Hartree energy. This form is independent of unit system and is manifestly dimensionless. In the same way, eq. (12.1.5) is better written as

$$S_k = \sum_n f_n \left( \frac{\hbar \omega_n}{E_h} \right)^k \tag{12.1.5}$$

while the expression for $S_2$ three lines lower is better written as $S_2 = \overline{\alpha}/4\pi \varepsilon_0 a_0^3$.

p. 199:
There is a superfluous minus sign in eq. (12.3.10), which should read

$$i \frac{\partial \Psi}{\partial t} = -\sum_k \nabla_k^2 \Psi + V \Psi \tag{12.3.10}$$

p. 213:
There is an error in the first expression given for $R_{20}$, which should be $R_{20}(r) = \frac{1}{2} (3z^2 - r^2)$.

p. 225:
The conversion factor table for dipole moment units has a typographical error; in the second row of numbers, 1 Debye should be shown as equal to $3.33564095 \times 10^{-30}$ Cm, and (of course) to 1 Debye.
p. 233, Table F.1:
The following entries should be corrected as shown:

31c  $00 R^{-4} \frac{1}{3} \sqrt{6r_c^2}(5r_c^2 - 1)$
31s  $00 R^{-4} \frac{1}{3} \sqrt{6r_c^2}(5r_c^2 - 1)$
33c  $1\beta R^{-5} \frac{1}{4} \sqrt{10(7r_c^3 r_b^3 + 3(r_c^3 - r_b^3)c_{\alpha\beta}} - 21r_c^3 r_b^3 r_d^3 - 6r_c^3 r_b^3 c_{\alpha\beta})$

The following corrections need to be made to all versions up to and including the 2000 reprint:

p. 24, first paragraph of S.2.3.1:
The symbol Å for Ångstrom is twice misprinted as rA.

p. 32:
The last line of S.2.6 should read
... the symbol C denotes $\frac{1}{2}C_{\alpha\beta,\alpha\beta} = \frac{1}{10} \sum \alpha_{2k2k}$.

p. 54, below eqn (4.2.2):
In the third line below the equation, there is a missing factor of $-\frac{1}{2}$. It should read:
... and the induction energy is $-\frac{1}{2}q^2 \alpha_{2k}/((4\pi e_0)^2 z^4)$.

p. 62, eq. (4.3.22):
The factor $h/\pi$ should be $h/2\pi$.

p. 140, eqs. (8.7.1) and (8.7.2):
The factor $h/\pi$ should be $h/2\pi$.

p. 188, eq. (12.1.6): This equation should read
$$\alpha(iv) = 4\pi e_0 a_0^3 E_k^2 \frac{1}{\hbar^2} \sum_{k=1}^{N} \frac{f_k}{\alpha_k^2 + v^2},$$

p. 214, eq. (B.1.7): These equations apply for $m > 0$.

p. 229, Table E.2:
The following entries should be corrected as shown:

$\Omega_{xyy} = -\sqrt{\frac{7}{3}}Q_{33c} - \sqrt{\frac{7}{3}}Q_{31c}$
$\Omega_{yyyy} = -\sqrt{\frac{7}{3}}Q_{33c} - \sqrt{\frac{7}{3}}Q_{31c}$
$\Phi_{xxxx} = \frac{1}{8}Q_{40} - \frac{1}{8}\sqrt{35}Q_{42c} + \frac{1}{8}\sqrt{35}Q_{44c}$
$\Phi_{xyy} = \frac{1}{8}Q_{40} - \frac{1}{8}\sqrt{35}Q_{44c}$
$\Phi_{yyyy} = \frac{1}{8}Q_{40} + \frac{1}{8}\sqrt{35}Q_{42c} + \frac{1}{8}\sqrt{35}Q_{44c}$
$\Phi_{xxz} = \frac{1}{16}(-3\sqrt{70}Q_{41c} + \sqrt{70}Q_{43c})$